

## REMARKS/ARGUMENTS

### Status of the Application

Claims 1, 3-8, and 10-21 are currently pending in the application. Of these:

- Claims 1, 3, 4, 7, 8, and 10 stand rejected under 35 USC 102(e) as anticipated by Uppaluri;
- Claim 5 and 6 are objected to as being dependent on a rejected base claim. The Examiner is thanked for the indication that these claims are directed to allowable subject matter.
- Claims 2 and 9 have been cancelled by this amendment.
- Claims 11-21 have been added by this amendment.

### Independent Claim 1

Claim 1 has been amended to incorporate former claim 2. Amended claim 1 now requires, among other things, that *the texture analysis includes the step of: determining a typical Hounsfield value of a local pulmonary parenchyma on the basis of a peak of a texture based roughness-histogram.*

The assertion that this limitation is disclosed at Uppaluri col. 4 lines 9-28 and col. 6 lines 34-51 is respectfully traversed.

The cited portion of Uppaluri column 4 describes certain steps used to analyze a medical image, and more particularly a first step 100, in which a CT scan is performed and series of CT slices are obtained. While the cited portion discloses certain attributes of the CT scanner and the resultant image data, it does not disclose the foregoing aspects of claim 1. It should be noted that, as conventional in the CT art, the image data includes a plurality of pixels, the gray levels of which represent the radiation attenuation of the patient's anatomy.

In contrast to claim 1, which requires a *texture based roughness-histogram*, the cited portion of Uppaluri column 6 describes a *grey level histogram*. More specifically, and as taught by Uppaluri, the grey level histogram visually indicates the total number of

pixels in the ROI that have a particular *grey level*. While Uppaluri teaches that various measures can be used to assess the *grey level* histogram (e.g., measures that describe the overall lightness/darkness of the image and the shape, asymmetry, and peakedness of the histogram), Uppaluri does not disclose the claimed texture based roughness-histogram.

Thus, Uppaluri fails to disclose that the texture analysis includes determining a typical Hounsfield value of a local pulmonary parenchyma on the basis of a peak of a *texture based roughness-histogram*. An example of the generation of such a histogram is shown at page 7, lines 9-19 of the application as filed. In any case, and as specifically recited in the claim, the histogram of claim 1 is a texture-based roughness histogram, not a grey level histogram.

In addition to failing to disclose the claimed texture based roughness-histogram, Uppaluri also does not teach using such a histogram to determine the typical Hounsfield value of a local pulmonary parenchyma.

As Uppaluri fails to disclose each and every element of claim 1, withdrawal of the present rejection is requested.

#### **Independent Claim 7**

Claim 7 has been amended to incorporate the limitations of former claim 3. As amended, claim 7 now requires that *the texture analysis includes computing a typical parenchyma Hounsfield value for the lung; and marking all areas in the whole lung area with a Hounsfield value higher than the typical parenchyma Hounsfield value.*

The assertion that this limitation is disclosed at column 6 line 34 to column 8 line 16 is respectfully traversed.

More specifically, the cited portion of discloses various grey level distribution measures and percentile measures that can be used to assess the grey level histogram. It also discloses second order texture measures to determine the presence of a pulmonary tissue pathology. The cited portion does not, however, disclose or suggest *marking all areas in the whole lung area with a Hounsfield value higher than the typical parenchyma*

*Hounsfield value* as required by claim 1. Should the Examiner wish to maintain the present rejection, the Examiner is invited to point out with specificity that portion of the cited text that is believed to disclose the foregoing limitation.

**Independent Claim 10**

Claim 10 has been amended to include the limitations of former claim 4. As amended, claim 10 now requires that *the texture analysis include the steps of: determining first image elements in the plurality of two-dimensional slice images belonging to the lung by performing a segmentation of the lung from in the plurality of two-dimensional slice images; and determining second image elements from the first image elements; wherein the second image elements belong to a solid structure.*

The assertion that the foregoing limitations are disclosed at Uppaluri col. 6 line 34 – col. 8 line 16 is respectfully traversed.

Again, the cited portion of Uppaluri discloses various grey level distribution measures and percentile measures that can be used to assess the grey level histogram. It also discloses second order texture measures to determine the presence of a pulmonary tissue pathology. The cited portion does not, however, disclose or suggest the claimed segmentation and determining operations.

In this regard, the Examiner's attention is directed to Uppaluri col. 4 lines 29-62, which describes a segmentation procedure.

Should the Examiner wish to maintain the present rejection, the Examiner is invited to point out with specificity that portion of the cited text that is believed to disclose the claimed determining operation.

**Dependent Claim 3**

The remarks above with respect to claim 7 apply *mutatis mutandis* to claim 3.

**Dependent Claim 4**

The remarks above with respect to claim 10 apply *mutatis mutandis* to claim 4.

**Dependent Claims 5 and 6**

The Examiner is thanked for the indication that claims 5 and 6 are directed to allowable subject matter. Applicant reserves the right to present these claims in independent form containing the limitations of original base claims 1 and 4 at a later stage of the proceeding.

**Dependent Claim 8**

The remarks above with respect to claim 1 apply *mutatis mutandis* to claim 8.

**New Dependent Claims 11 and 12**

New claims 11 and 12, which depend from claim 10, correspond to former dependent claims 2 and 3, respectively. These claims are believed allowable at least by virtue of their dependency from claim 10. Moreover, the remarks above with respect to claim 1 and 7 apply *mutatis mutandis* to these claims.

**New Dependent Claims 13 and 14**

New claims 13 and 14, which depend from claim 10, correspond to dependent claims 5 and 6, respectively (note that claim 10 has been amended to include the limitations of dependent claim 4). As these claims have not been substantively amended, it is submitted that claims 13 and 14 are, like claims 5 and 6, directed to allowable subject matter.

**New Dependent Claims 15 – 21**


It is submitted that claims 15 through 21 are amply supported by the application as filed and distinguish patentably and non-obviously over the prior art of record.

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### **Conclusion**

In view of the foregoing, it is submitted that claims 1, 3-8, and 10-21 distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited.

Respectfully submitted,  
DRIGGS, HOGG & FRY CO., L.P.A.



John J. Fry Reg. No. 35,873  
Driggs, Hogg & Fry Co., L.P.A.  
38500 Chardon Road  
Willoughby Hills, Ohio 44094  
Phone: 1.440.391.5100  
Fax: 1.440.391.5101

**Please direct all further correspondence to:**

Thomas M. Lundin, Registration No. 48,979  
Philips Intellectual Property & Standards  
595 Miner Road  
Cleveland, Ohio 44143  
Phone: 440.483.4281  
Fax: 440.483.2452